

"VERSION WITH MARKINGS TO SHOW CHANGES MADE"

IN THE SPECIFICATION:

Paragraph beginning at line 10 of page 1 has been amended as follows:

[At present, studies for practically using ultrasonic] [motors are actively made, and various] Various ultrasonic motors [are] have been proposed[. However, almost of all in practical use] which employ circular or annular vibrating bodies[, wherein] [deflection-vibration is] oscillated in a circumferential direction of the vibrating body to thereby [driving the] drive a moving body. [For example, such] Such an example is shown in Japanese Patent Publication No. 7750/1994.

Paragraph beginning at line 17 of page 2 has been amended as follows:

Meanwhile, in the structure [as] shown in Japanese Patent Laid-open No. 337052/1998, a large output cannot be obtained because the piezoelectric element is small in area. Further, because [of] the structure [having] has a plurality of cantilevers, the resonant frequency deviates between the cantilevers thus having a problem with deviation in individual motor characteristics. Furthermore, there is the disadvantage [has been defect] that the direction of rotation is in only one direction.

Paragraph beginning at line 25 of page 2 has been amended as follows:

In view of the above problems, the present invention realizes an ultrasonic motor capable of suppressing [in crease] an increase in resonant frequency and obtaining a great amplitude even if made [in] smaller, and it is an object to provide an excellent-quality ultrasonic motor that is simple [in] to manufacture and mass produce, [manufacturing method and mass-producible at one time,] and to provide an electronic apparatus [using same] having the ultrasonic motor.

Paragraph beginning at line 1 of page 4 has been amended as follows:

[Also, by] By providing a plurality of [electrode] electrodes on the piezoelectric element disposed on the vibrating body and either selecting an electrode to which a drive signal is applied or changing the phase of a drive signal, the node of vibration to be oscillated by the vibrating body can be moved to vary a direction of rotation of the moving body.

IN THE CLAIMS:

Claims 3/2, 4, 5, 6/2, 10 and 11/2 have been canceled without prejudice or admission.

Claims 1, 2, 3/1, 6/1, 7-9, 11/1, 12-17 and 18 have been amended as follows:

1. (Amended) An ultrasonic motor comprising:
a vibrating body; [in a quadrilateral plate form having a piezoelectric element,]
a piezoelectric element disposed on the vibrating body and for generating a vibration wave to vibrate the vibrating body the vibration wave having a vibration node disposed on a diagonal line of the vibrating body;
a at least one protrusion connected to [provided on] the vibrating body[,]
for vibration therewith, the protrusion being disposed on the vibrating body at a position which does not correspond to the position of the vibration node; and
a moving body disposed in contact with and driven by the protrusion during vibration thereof [and driven by this, the piezoelectric element being characterized to cause a vibration wave having a node on a diagonal line of the vibrating body; and
the protrusion being provided in a position off the node.]

2. (Amended) An ultrasonic motor comprising:
a vibrating body; [in a quadrilateral plate form having a piezoelectric element,]

a piezoelectric element disposed on the vibrating body and for generating a vibration wave to vibrate the vibrating body, the vibration wave having a vibration node disposed on a line connecting a center of a first side of the vibrating body and a center of a second side of the vibrating body opposite to the first side;

a at least one protrusion [provided on] connected to the vibrating body[,] for vibrating therewith, the protrusion being disposed on the vibrating body at a position which does not correspond to the position of the vibration node; and

a moving body disposed in contact with and driven by the protrusion during vibration thereof. [and driven by this,

the piezoelectric element being characterized to cause a vibration wave having a node on a line connecting between a center of a first side of the vibrating body and a center of a second side opposed to the first side; and

the protrusion being provided in a position off the node.]

3. (Amended) [The] An ultrasonic motor according to claim 1; [or 2:] wherein the at least one protrusion comprises two protrusions disposed symmetrically [is two in number, and the protrusions being provided in positions of point symmetry] about a center of the vibrating body [as reference].

6. (Amended) [The] An ultrasonic motor according to claim 1; [or 2:

wherein] further comprising a support member for supporting a center [portion] of the vibrating body [is supported].

7. (Amended) An [The] ultrasonic motor according to claim 1[:]

wherein one diagonal line of]; further comprising a support member for supporting the vibrating body [is supported] along the diagonal line thereof.

8. (Amended) [The] An ultrasonic motor according to claim 1[:]

wherein]; further comprising a support member for at least two corners [on at least one diagonal line on] of the vibrating body along the diagonal line thereof [are supported].

9. (Amended) [The] An ultrasonic motor according to claim [2:]

wherein support is on] 1; further comprising a support member for supporting the vibrating body along a line connecting [between] a center of a first side [on] of the vibrating body and a center of a second side of the vibrating body opposite [opposed] to the first side.

11. (Amended) [The] An ultrasonic motor according to claim 1; [or 2:]

wherein the vibrating body has a groove [is in a portion of the vibrating body corresponding to the node] formed in a surface thereof and along the diagonal line.

12. (Amended) [The] An ultrasonic motor according to claim 1[:]; wherein the piezoelectric element has four electrode portions divided by two diagonal lines of the vibrating body[,]; and wherein a drive signal [being] is applied to two of the electrode portions [electrodes of them] to thereby drive the vibrating body.

112
No Parent 13. (Amended) [The] An ultrasonic motor according to claim [2:]; wherein the piezoelectric element has four [electrodes] electrode portions divided by two lines [regions due to] connecting a center [points] of a first side of the vibrating body and a center of a second side of the vibrating body opposite the first side [sides of the vibrating body, and a drive signal being applied to two electrodes of them to thereby drive the vibrating body].

14. (Amended) An ultrasonic motor comprising: [A piezoelectric driving body having] a generally plate-shaped vibrating body; [in a plate form] and a piezoelectric element bonded on the vibrating body and having a plurality of electrodes[, the piezoelectric driving body being characterized in that polarizing directions of the piezoelectric element having a plurality of electrodes are

all] polarized in same direction for vibrating the vibrating body.

15. (Amended) [The] An ultrasonic motor according to claim 14; [1,] wherein the plurality of electrodes comprises [piezoelectric element has] four electrode portions divided by two diagonal lines of the vibrating body[,]; and wherein the vibrating body is vibrated by applying drive signals different in phase by 180 degrees [being applied] to two of the electrode portions [electrodes of them and remaining two electrodes to thereby drive the vibrating body].

16. (Amended) [The] An ultrasonic motor according to claim 14; [2,] wherein the plurality of electrodes comprises [piezoelectric element has] four [electrodes] electrode portions divided by two lines connecting a center of a first side of the vibrating body and a center of a second side of the vibrating body opposite the first side; [regions due to connecting center points of sides of the vibrating body, and] wherein the vibrating body is vibrated by applying drive signals different in phase by 180 degrees [being applied] to two of the electrode portions [electrodes of them and remaining two electrodes to thereby drive the vibrating body].

17. (Amended) An ultrasonic motor comprising: a vibrating body having a piezoelectric element[,]; a moving

body [to be] rotationally driven by a vibration of the vibrating body[,]; and a [pressure-applying body for providing contact pressure to between the vibrating body and the moving body, the ultrasonic motor being characterized in that the pressure-applying body becomes a guide for rotation of the moving body] pressurizing member for pressing the moving body into pressure contact with the vibrating body and for guiding rotational movement of the moving body.

18. (Amended) An electronic apparatus comprising:
an ultrasonic motor according to claim 1; a transmission
mechanism for transmitting movement of the moving body; and an
output mechanism for producing an output motion in accordance
with the movement transmitted in the transmission mechanism.
[being characterized by having an ultrasonic motor or a piezoelectric driving body according to claims 1 to 17.]